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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,652	09/29/2003	Allen J. McLenaghan	CED 6008	2351

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SENNIGER POWERS LEAVITT AND ROEDEL
ONE METROPOLITAN SQUARE
16TH FLOOR
ST LOUIS, MO 63102

EXAMINER

GUSHI, ROSS N

ART UNIT PAPER NUMBER

2833

DATE MAILED: 05/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,652

Applicant(s)

MCLENAGHAN, ALLEN J.

Examiner

Ross N. Gushi

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-35 is/are rejected.
- 7) ☐ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/29/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in —

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a);

Claims 1, 3-9, and 21-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Pass.

Per claim 1, Pass discloses an electrical circuit assembly comprising a substrate, an integrated circuit device 12 electrically and mechanically connected to the substrate, at least one electrically conductive connecting element 16 on one of the substrate and circuit device, at least one socket 40 on the other of the substrate and circuit device for receiving said at least one connecting element, said socket comprising at least two resilient members 60 biased against said connecting element so that the circuit device and the substrate are held in electrical and mechanical connection by the biasing force of the resilient members against the connecting element.

Per claim 3, said at least one electrically conductive connecting element comprises a pin projecting from a surface of the substrate or circuit device.

Per claim 4, said at least two resilient members comprise opposed spring fingers electrically connected to the substrate or the circuit device.

Per claim 5, said spring fingers have inturned free end portions which form an opening for receiving said at least one electrically conductive connecting element.

Per claim 6, said spring fingers are C-shaped.

Per claim 7, said at least one electrically conductive connecting element has a body with an axial length extending from a first end of the connecting element connected to the substrate or circuit device to a second free end.

Per claim 8, the body of said at least one electrically conductive connecting element is headless.

Per claim 9, said body is cylindrical and of substantially uniform diameter throughout the axial length of the connecting element.

Per claim 21, the substrate is a printed circuit board for an electronic device.

Claims 22-25, are rejected for the reasons pertaining to claims 1, 3-9 and 21.

Claims 1, 13-16, 31, 32, 34, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Taylor.

Per claim 1, Taylor discloses an electrical circuit assembly comprising a substrate, an integrated circuit device 2 electrically and mechanically connected to the substrate, at least one electrically conductive connecting element 5 on one of the substrate and circuit device, at least one socket 20 on the other of the substrate and

circuit device for receiving said at least one connecting element, said socket comprising at least two resilient members 40 biased against said connecting element so that the circuit device and the substrate are held in electrical and mechanical connection by the biasing force of the resilient members against the connecting element.

Per claim 13, said at least one electrically conductive connecting element comprises a solder ball.

Per claims 14, 15, 16, the solder ball is a conductive bonding agent (i.e. it may be used to bond the chip package and terminal 20.

Claims 31, 32, 34, and 35 are rejected for the reasons pertaining to claims 1, 13-16

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7, 10, 11, 12, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor as in claim 1 in view of Imasu et al. ("Imasu").

Regarding claim 7, arguably the solder ball 5 of Taylor is not a body with an axial length extending from a first end of the connecting element connected to the substrate or circuit device to a second free end. Imasu discloses multi-stage stud bumps (13a-13c) with an axial length extending from a first end of the connecting element connected to the substrate or circuit device to a second free end. At the time of the invention, it

would have been obvious to replace the Taylor chips with integrated circuits including multi-stage solder bumps as taught in Imasu. The suggestion or motivation for using such chips is that such chips have various well known advantages such increased transfer speeds and reduced sizes (see e.g. Imasu col. 1 lines 15-50).

Per claim 10, body (13a-13c) comprises at least one shoulder that engages the resilient members of the socket to provide an interlocking force supplementing the biasing force of the resilient members to hold the circuit device and the substrate in electrical contact.

Per claim 11, said at least one electrically conductive connecting element comprises a stud bump made from metal deposited on the electrical connection pad of the substrate or circuit device.

Per claim 12, said metal is gold.

Claims 26-29 are rejected for the reasons pertaining to claims 7, 10, 11, and 12.

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pass as in claims 1, 3-9, and 21-25.

Regarding the whether the Pass circuit device is a MEMS device, chip scale package, optoelectronic device or whether the substrate is a test substrate, at the time of the invention, it would have been obvious that the Taylor circuit device may be any number of various well known circuit devices such as a MEMS device, chip scale package, or optoelectronic device. The selection of a circuit device from a list of known device types would have been a matter of obvious engineering choice. Likewise the

type or function of the substrate would have been a matter of obvious engineering choice.

Claims 26, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Pass as in claim 1, 3-9, 21-25 in view of Imasus as discussed regarding claims 7, 10, 11, 12. At the time of the invention, it would have been obvious to use chips such as taught in Imasu with sockets such as taught by Pass. The suggestion or motivation for using such chips is that such chips have various well known advantages such increased transfer speeds and reduced sizes (see e.g. Imasu col. 1 lines 15-50).

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor as in claim 31 in view of Pass. Taylor does not use inturned free ends. Pass uses inturned free ends 66. At the time of the invention, it would have been obvious to turn in the arms of the Taylor terminal 40. The suggestion or motivation for doing so would have been to prevent damage to the terminal or chip package as taught in Pass (see e.g. col. 4, lines 35-55).

Allowable Subject Matter

Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


The following is a statement of reasons for the indication of allowable subject matter: Regarding claim 2, the prior art does not suggest the assembly as claimed, including the combination of all the claimed elements, the combination including that

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the electrically conductive connecting element is on the substrate and at least one resilient socket is on the integrated circuit device (where applicant has defined "integrated circuit devices" as "i.e., microchips, chips or dies"). Specification page 1, line 6.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ross Gushi whose telephone number is (571) 272-2005. If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Paula A. Bradley, can be reached at 571-272-2800 extension 33. The phone number for the Group's facsimile is (703) 872-9306.


ROSS GUSHI
PRIMARY EXAMINER